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**Network Aspects (NA);
Terminal selection principles for priority 1 and 2 services
of MoU - ISDN applicable in multi-terminal environments
at customer premises**

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Foreword

This ETSI Technical Report (ETR) has been prepared by the Network Aspects (NA) Technical Committee of the European Telecommunications Standards Institute (ETSI). ETRs are informative documents resulting from ETSI studies which are not appropriate for European Telecommunication Standard (ETS) or Interim European Telecommunication Standard (I-ETS) status. An ETR may be used to publish material which is either of an informative nature, relating to the use or application of ETSs or I-ETSs, or which is immature and not yet suitable for formal adoption as an ETS or an I-ETS.

Introduction

Terminal selection is a complex mechanism which relies heavily on the basic call setup protocols according to ETS 300 102-1 [2] and makes use of complementary elements involved in the call setup process, some of them referring to terminal identity and some others referring to compatibility. The elements referring to terminal identity include any type of number, such as ISDN number and subaddress. The elements referring to terminal compatibility include any type of compatibility information, such as bearer capability, low layer compatibility and high layer compatibility. Terminal selection is therefore a combination of terminal identification (based on a number without any relationship to compatibility) and compatibility checking up to a prescribed degree, whereby these two mechanisms are used in a complementary manner. For further information see CCITT Recommendation I.333 [12].

This report describes in more detail the basic principles of terminal selection and the combined use of the elements involved. It is meant as a guidance for both terminal manufacturers and the users of a multiple terminal arrangement (e.g. passive-bus, S-bus).

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1 Scope

The scope of this technical report is to give detailed guidance on the application of Integrated Services Digital Network (ISDN) terminal selection features to both terminal manufacturers and ISDN customers. In case of multiple terminal arrangements at called subscribers premises, the location of a multiple terminal arrangement (e.g. passive-bus, S-bus) is at either:

- an S/T reference point (respectively coincident S, T reference point); or
- an S reference point.

Terminal selection issues for Memorandum of Understanding (MoU) tele-services and bearer services are considered both for pure ISDN (MoU) end-to-end calls, and for calls in scenarios where also non-MoU ISDNs or dedicated networks are involved. In the latter case interworking is considered between MoU ISDN services and their equivalent in other networks. Service selection for multiple teleservice terminals and multiple terminal installations is covered for incoming calls for a limited number of combinations. This report does not add any new technical requirements or procedures for terminal selection to the ones described in the referenced ETSI and CCITT documents, however it gives some advice on the applicability of some CCITT Recommendations.

2 References

This ETR incorporates by dated or undated reference, provisions from other publications. These references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to, or revisions of any of these publications apply to this ETR only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ETS 300 125 (1990): "Integrated Services Digital Network (ISDN); User-network interface data link layer specification Application of CCITT Recommendations Q.920/I.440 and Q.921/I.441".
- [2] ETS 300 102-1 (1990): "Integrated Services Digital Network (ISDN); User-network interface layer 3 Specifications for basic call control".
- [3] ETR 018 (1990): "Integrated Services Digital Network (ISDN); Application of the BC-, HLC-, LLC- information elements by terminals supporting ISDN services".
- [4] Draft prETS 300 007 (March 1990): "Integrated Services Digital Network (ISDN); Support of packet mode terminal equipment by an ISDN (T/S 46-50)".
- [5] Draft prETS 300 050 (July 1990): "Integrated Services Digital Network (ISDN); Multiple Subscriber Number (MSN) supplementary service Service Description (T/NA1(89)20)".
- [6] Draft prETS 300 051 (July 1990): "Integrated Services Digital Network (ISDN); Multiple Subscriber Number (MSN) supplementary service Functional capabilities and information flows (T/S 22-15)".
- [7] Draft prETS 300 052 (July 1990): "Integrated Services Digital Network (ISDN); Multiple Subscriber Number (MSN) supplementary service Digital Subscriber Signalling System No. one (DSS1) (T/S 46-33B)".
- [8] Draft prETS 300 059 (July 1990): "Integrated Services Digital Network (ISDN); Subaddressing (SUB) supplementary service Service description (T/NA1(89)16)".
- [9] Draft prETS 300 060 (July 1990): "Integrated Services Digital Network (ISDN); Subaddressing (SUB) supplementary service Functional capabilities and information flows (T/S 22-26)".

- [10] Draft prETS 300 061 (July 1990): "Integrated Services Digital Network (ISDN); Subaddressing (SUB) supplementary service Digital Subscriber Signalling System No. one (DSS1) protocol (T/S 46-33I)".
- [11] Draft prETS 300 080 (August 1990): "Integrated Services Digital Network (ISDN); ISDN lower layer protocols for telematic terminals (T/TE 12-04)".
- [12] CCITT Recommendation I.333: "Terminal selection in ISDN".

3 List of abbreviations

AU	Access Unit
BC	Bearer Capability
CCITT	the International Telegraph and Telephone Consultative Committee
DDI	Direct Dialling In
DSS1	Digital Subscriber Signalling System No. 1
ETSI	European Telecommunications Standards Institute
IDN	Integrated Digital Network
ISDN	Integrated Services Digital Network
HLC	High Layer Compatibility
LLC	Low Layer Compatibility
MSN	Multiple Subscriber Number
MoU	Memorandum of Understanding
PSPDN	Packet Switched Public Data Network
PSTN	Public Switched Telephone Network
SUB	Subaddressing
TMR	Transmission Medium Requirement

4 List of services and specific user applications covered

4.1 MoU services

The following telecommunication services are covered either in this document or by cross-reference to ETR 018 "Application of the BC-, HLC- and LLC-information elements by terminals supporting ISDN services" [3].

- 1: Circuit-mode bearer services categories
 - 1.1: Circuit-mode 64 kbit/s 8 kHz structured bearer service category usable for speech information transfer (digital telephony)
 - 1.2: Circuit-mode 64 kbit/s unrestricted 8 kHz structured bearer service category
 - 1.3: Circuit-mode 64 kbit/s 8 kHz structured bearer service category usable for 3,1 kHz audio information transfer

- 2: Packet-mode bearer service categories (case B of X.31)
 - 2.1: Virtual call bearer service
 - 2.1.1: Access through the B-channel
 - 2.1.2: Access through the D-channel
- 3: Teleservices
 - 3.1: Telephony teleservice (3,1 kHz bandwidth)
 - 3.2: Teletex service
 - 3.3: Telefax group 4 service
 - 3.4: ISDN syntax-based videotex service
 - 3.5: 7 kHz Telephony service (for further study)
 - 3.5.1: 7 kHz Telephony service where fallback to 3,1 kHz mode is allowed
 - 3.5.2: 7 kHz Telephony service where fallback to 3,1 kHz mode is not allowed
 - 3.6: ISDN Videotelephony service (for further study)
 - 3.7: Facsimile group 2/3 service

The following specific user applications of some bearer services are covered either in this document or by cross-reference to ETR 018 "Application of the BC-, HLC- and LLC-information elements by terminals supporting ISDN services" [3].

- A) Specific user applications of the circuit-mode 64 kbit/s unrestricted 8 kHz structured bearer service:
 - 1: Support of terminal adaptors V.110/X.30
 - 1.1: Synchronous mode of operation
 - 1.2: Asynchronous mode of operation
 - 2: Support of X.25 terminal equipment allowing access to PSPDN via AU (case A of X.31)
 - 2.1: Rate adaption using X.31 HDLC flag stuffing
 - 2.2: Rate adaption corresponding to CCITT Recommendations V.110/X.30.
- B) Specific user applications of the circuit-mode 64 kbit/s 8 kHz structured 3,1 kHz audio bearer service
 - 1: Voice band data via modem

4.2 MoU equivalent services for which interworking with MoU services is considered

4.2.1 Equivalent services offered in PSTN

The following PSTN services for which interworking with equivalent ISDN services is considered are covered in this document:

- speech;
- facsimile Group 2/3 service.

Specific user applications of the PSTN are also covered in this document:

- voice band data via modem.

4.2.2 Equivalent services offered in PSPDN

The following PSPDN services for which interworking with equivalent ISDN packet mode bearer services is considered are covered in this document:

- X.25 Virtual Call service (VC);
- X.25 Permanent Virtual Circuit service (PVC).

Furthermore, examples of applications involved in this interworking are:

- teletex;
- facsimile Group 4 service;
- X.400 (MHS/EDI).

4.2.3 Equivalent services offered in pre-ISDNs, pilot ISDNs and extended IDNs

For the characteristics of these networks see subclause 7.3.

The following circuit-switched services originating in pre-ISDNs, etc., for which interworking with the equivalent ISDN services is considered, are covered in this document:

- speech;
- facsimile Group 2/3 service;
- 64 kbit/s unrestricted 8 kHz structured data service;
- teletex service;
- Facsimile Group 4 service.

5 General Principles

Terminal selection primarily relies on end-to-end user capabilities.

Any information which:

- 1) categorises attributes of an incoming call; or
- 2) refers to a terminal identity; or
- 3) specifies the call source which could be ISDN or non-ISDN;

may be used for the terminal selection process.

The terminal selection process is a combination of out-of-band compatibility checking and terminal identification which are used in a complementary manner as part of the call setup protocol according to ETS 300 102-1 [2].

From the networks point of view, in-band compatibility checking is not related to terminal selection, since it starts when a terminal was selected.

Intelligent units at the called subscriber premises which might select a terminal based on the information made available by in-band procedures are out of the scope of this ETR.

5.1 Out-of-band compatibility checking

With respect to out-of-band compatibility checking the following elements are relevant. These elements have calling party to called party significance:

- Bearer Capability information element (BC);
- Low Layer Compatibility information element (LLC);
- High Layer Compatibility information element (HLC).

NOTE: In cases of interworking, e.g. between a MoU ISDN and a non-MoU ISDN, where different speech codings are applied or where a network embedded service interworking is activated, the BC may be changed between calling and called party.

5.2 Terminal identification

With respect to terminal identification the following elements are relevant. These elements have calling party to called party significance:

- Called Party Number information element;
- Called Party Subaddress information element.

NOTE 1: An element such as Terminal Endpoint Identifier (TEI) (see ETS 300 125 [1], subclause 3.3.4) is out of the scope of this report. It is locally used and based on mapping from elements with calling party to called party significance which takes place in the terminating local exchange.

NOTE 2: For specific applications the user may use other information elements for notification, such as Calling Party Number or Closed User Group identity. The use of this kind of information elements is out of the scope of this report.

Any type of address such as ISDN number and subaddress, cannot by itself ensure compatibility.

The Called Party Number information element, Called Party Subaddress information element and/or techniques as DDI, MSN may provide an alternative for the missing compatibility information. An example of this is the case of a call from a non-ISDN network (e.g. PSTN or PSPDN) to the ISDN. In this case compatibility is not ensured.

For details concerning the delivery of the called party number see specifications on the "Multiple Subscriber Number (MSN)", supplementary service (ETS 300 050 [5], ETS 300 051 [6] and ETS 300 052 [7]).

For details concerning the delivery of the called party subaddress, see specifications on the "Subaddressing (SUB)", supplementary service (ETS 300 059 [8], ETS 300 060 [9] and ETS 300 061 [10]).

5.3 Progress indicator

The signalling means by which the calling and/or the called user is notified that interworking with a conventional (non-ISDN) signalling system has occurred is called the "progress indicator".

On the ISDN-access, the progress indicators are carried in a progress indicator information element which itself is included in a call control message sent to the calling or called user.

5.3.1 Purpose of the progress indicator

The purpose of the progress indicator is to describe an event which has occurred during the life of the call. Such an event may be, e.g., when:

- a call leaves the ISDN; or
- the call enters the ISDN; or
- the distant user (calling or called) is not ISDN; or
- the call has returned to the ISDN at the same point it had left due to redirection within the non-ISDN.

In all these cases there will be limitations in the network or distant user signalling that may restrict the information available to the called or calling user.

5.3.2 Possible values of the progress indicator

In the context of interworking issues as dealt within this ETR, four progress indicator values are relevant:

- progress indicator No.1 indicates that interworking with a non-ISDN has occurred within the network or networks through which the call has traversed;
- progress indicator No.2 indicates that the destination user is not ISDN;
- progress indicator No.3 indicates that the origination user is not ISDN;
- progress indicator No.4 indicates that a call which has left the ISDN has returned to the ISDN at the same point it had left due to a redirection within the non-ISDN.

The exact use of the progress indicator values is specified in Annex I of ETS 300 102-1 [2].

5.3.3 Compatibility checking when a progress indicator is present

In cases where the network cannot provide all incoming call information, or where the network is not aware of the existence or absence of some service information (such as compatibility information), the incoming SETUP message includes a progress indicator information element, containing progress indicator No. 1 "Call is not end-to-end ISDN, further call progress information may be available in-band" or No. 3 "Origination address is non-ISDN".

The terminal equipment receiving a SETUP message with a progress indicator information element shall modify its compatibility checking. The terminal equipment should regard the compatibility as successful if it is compatible with the included information, which as a minimum, will be the BC information element. A terminal equipment expecting information in addition to the BC information element in a full ISDN environment need not reject the call if such information is absent but a progress indicator information element is included.

For more detailed information about the general principles of terminal selection see Annex B of ETS 300 102-1 [2] and CCITT Recommendation I.333 [12].

5.4 Terminal selection mechanism

Terminal selection tools in the MoU ISDN provide the functionality to do selection on two levels:

- 1) selection of the set of fully compatible terminals out of a multiple terminal arrangement (e.g. S-bus);
- 2) selection of an individual terminal within the set of compatible terminals at a multiple terminal arrangement. In the selection of individual terminals it is possible to define groups and/or subgroups of individual terminals in the set of compatible terminals.

In pure ISDN calls, the compatibility elements provide the functionality to select the set of compatible terminals. In interworking cases, when compatibility information is not complete, identification elements are to be used when in a multiple terminal arrangement (e.g. passive-bus, S-bus) terminals supporting different teleservices react on this incomplete compatibility information.

The network's selection of a particular terminal out of a set of compatible terminals is based on from which terminal it first receives a CONNECT-message. Depending on terminal implementation a (human) user can determine which terminal should respond first (or should respond at all), e.g. by picking up the handset of a telephone.

When individual terminals are to be selected by the calling user specifically out of a set of compatible terminals, identification elements should be used in all cases.

The use of identification elements is structured in the Multiple Subscriber Number (MSN), Direct Dialling In (DDI) and Subaddressing (SUB) supplementary services. In many cases, the network which is interworked with is not able to carry subaddressing information. DDI is not applicable (see Clause 1, Scope).

MSN is the one assigned for terminal selection purposes.

5.5 Allocation of MSN numbers to terminals

For the allocation of MSN numbers to individual terminals, the following principles apply:

- 1) if a terminal shall be addressed individually by an incoming call SETUP message, then one MSN number shall be allocated to this terminal;
- 2) if, in addition to 1) above, a terminal shall be addressed as a member of, and simultaneously together with other terminals of a group (pool) of compatible terminals, then this terminal shall be allocated a second MSN number which will be identical for all members of that group (pool number);
- 3) if, in addition to 1) and 2) above, a terminal shall also be addressed globally, i.e., all compatible terminals connected to the same bus shall have the possibility to respond to an incoming call, then this terminal shall be allocated a third MSN number which will be identical for all terminals in a multiple terminal arrangement.

In order to reduce the requirements placed on terminals with respect to analysis and reaction on up to three different MSN numbers, some networks may, as a network option, support the following procedure:

- a) a global MSN number shall be agreed between the subscriber and the network provider, which allows addressing all the terminals on the multiple terminal arrangement (e.g. passive-bus, S-bus);
- b) when this global MSN number is received in the destination exchange, the exchange may suppress the MSN number and include no called party number information element in the SETUP message sent to the called subscriber.

By this procedure, all compatible terminals will accept the call according to ETS 300 102 [2], subclause 5.2.

6 Terminal selection in a pure MoU ISDN environment

6.1 Terminal selection by compatibility checking

Terminal selection by compatibility checking is based on the DSS1 layer 3 information elements:

- Bearer Capability (BC);
- Low Layer Compatibility (LLC); and
- High Layer Compatibility (HLC). These information elements are generated by the calling terminal, conveyed through the network and delivered to the called user within the SETUP message.

NOTE: Whether or not an HLC and/or a LLC information element has to be generated by the calling terminal depends on the service requested and the specific application of the service.

Upon receipt of the SETUP message, the called terminal shall check that the content of the BC, HLC and LLC information elements is compatible with the function it supports.

If the content of the information elements matches the terminal functions, the terminal shall accept the call.

If a mismatch is detected in checking any of the information elements mentioned above, then the terminal shall either ignore or reject the offered call.

For details see ETS 300 102-1, Annex B [2].

The exact codings of the information elements for a given service and/or a given user application are specified in the service specific standards (e.g. ETS 300 080 [11]) and in ETR 018 [3].

6.2 Terminal selection by identity checking

Terminal selection by identity checking is based on the DSS1 layer 3 information elements:

- Called Party Number; and
- Called Party Subaddress.

These information elements are generated by the calling terminal, conveyed through the network and delivered to the called terminal within the SETUP message.

Upon receipt of a SETUP message including identity information, the called terminal will check the addressing information received against the number(s) and/or subaddress(es) information assigned to the terminal.

In the case of a match, the terminal will accept the call if it is also compatible with the requested service.

In the case of a mismatch, the terminal will ignore or reject the offered call. For details see ETS 300 102-1, Annex B [2].

7 Terminal selection where non-ISDNs are involved

7.1 Calls from PSTN to ISDN where PSTN supports services corresponding to 3,1 kHz audio

7.1.1 PSTN to ISDN boundary

At the PSTN to ISDN boundary within the network the call will automatically be allocated the necessary fields to finally create an ISDN SETUP message for onward transmission to the ISDN subscriber. The parameters of this message will be as follows:

- Bearer Capability;
Information transfer capability = 3,1 kHz audio
Transfer mode = Circuit mode
- Called Party Number;
- Progress Indicator.

NOTE: No HLC, LLC or sub-addressing information will be available.

The progress indicator indicates to the receiving terminal that the call originated outside the ISDN.

This will prevent the receiving terminal rejecting the call when the full compatibility information is not included in the setup message.

According to subclause 5.3.2, progress indicator No.3 applies: "origination user is not ISDN".

7.1.2 Situation at the called subscriber premises

On the incoming side, within a multiple terminal arrangement (e.g. the ISDN passive-bus, S-bus), such a call will be answered by terminals which can communicate with 3,1 kHz audio bearer capability e.g.:

- telephones;
- group 2/3 facsimile machines;
- answering machines; and
- modem based terminals.

If there is more than one such terminal situated in a multiple terminal arrangement, then an additional selection process is required to ensure that the desired terminal is selected.

In the case of calls from the PSTN there is only one possible bearer capability (i.e. 3,1 kHz audio).

There is no HLC, LLC information, nor sub-addressing and no user to user signalling available.

With the limited amount of information available from the PSTN, only the MSN supplementary service of the ISDN can be used for terminal selection.

7.2 Calls from PSPDN to ISDN

7.2.1 X.31 Case A: Access to PSPDN services

A circuit switched connection will be set up between the AU (belonging to PSPDN) and the ISDN-user. The ISDN-user may be notified of the incoming call by means of ETS 300 102-1 [2] call offering procedures (conditional notification class).

The BC and LLC information elements will be present for compatibility checking purposes, coded according to ETR 018 [3]. Which is, according to ETS 300 007 [4], mainly (see NOTE 5 of subclause 7.2.2, below):

- Bearer Capability:
Transfer mode = Circuit mode;
- Low Layer Compatibility:
User information layer 1 protocol = the rate adaption method and the user rate
User information layer 2 protocol = CCITT Rec. X.25, link layer
User information layer 3 protocol = CCITT Rec. X.25, packet layer;
- Called Party; Number.

As an X.25 packet layer protocol cannot transfer any high layer compatibility information elements, use of address information contained in the ETS 300 102-1 [2] SETUP message is the only possibility to select a specific TE among several in a subscriber installation, i.e. use of the supplementary services MSN or SUB (see NOTES 1 and 2 of subclause 7.2.2 below).

7.2.2 X.31 Case B: Access to the ISDN virtual circuit service

The PH may notify the ISDN-user of an incoming call by means of ETS 300 102-1 [2] call offering procedures (conditional notification class). The BC information element will be present for compatibility checking purposes, coded according to ETR 018 [3], i.e.:

- transfer mode = Packet Mode;
- transfer rate = Packet;
- user information layer 2 protocol:
B-channel access = LAPB, CCITT Recommendation X.25, link layer
D-channel access = LAPD, CCITT Recommendation Q.921;
- user information layer 3 protocol = CCITT Recommendation X.25, packet layer.

Again, use of address information contained in the SETUP message is the only possibility to select a specific packet mode TE among several in a subscriber installation, i.e. use of the supplementary services MSN or SUB (see NOTES 1 and 3).

NOTE 1: The X.25 called address extension facility field may be used for subaddressing as X.31 provides for mapping between this field and the called party subaddress information element in the ETS 300 102-1 [2] SETUP message. As the X.25 address extension facility field is defined for the conveyance of the OSI NSAP address to access specific applications above layer 3 in a TE, the use of subaddresses for terminal selection is not recommended.

NOTE 2: Sub-addressing is only effective when setting up the first virtual call on a B-channel.

NOTE 3: Sub-addressing is only effective when setting up the first virtual call on a B- or D-channel.

NOTE 4: For the normal ISDN-ISDN case, the same applies.

NOTE 5: No progress indicator is available.

7.3 Calls from pre-ISDN, pilot ISDN or extended IDN to ISDN

Pre-ISDNs, pilot ISDNs or extended IDNs are assumed to have the following characteristics:

- they provide digital user-to-user connectivity;
- they support the circuit mode of operation; and
- the signalling system applied does not have full ISDN capability.

Therefore, at the interworking node, a progress indicator is generated to indicate a non-ISDN call source.

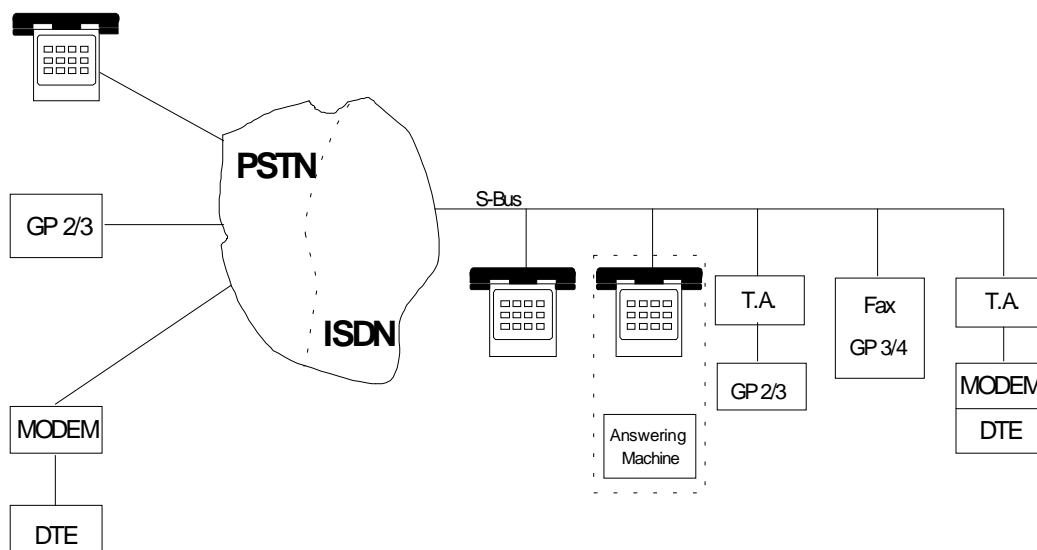
When interworking with the ISDN occurs, the interworking node will generate either of the BC or TMR codings:

- 64 kbit/s unrestricted digital information in the case where the calling terminal requires this transfer capability; or,
- 3,1 kHz audio in the case where the calling terminal supports a service normally provided in PSTNs.

The interworking function may be unable to provide all elements exactly specifying the service requested. This may imply that compatibility between calling and called terminal is not assured. Therefore, the calling user shall have the capability to define a terminal identity in order to allow the invocation of the supplementary service "Multiple Subscriber Number" when establishing a call.

For compatibility and identity checking, the principles laid down in subclauses 6.1 and 6.2 apply.

Annex A: PSTN to ISDN connections



NOTES: MSN numbering:

Global MSN number *	x	x	x	x	x
Group telephony	q	q			
Specific telephone	r				
Specific telephone		s			
Data					w
Group 3 facsimile			p	p	
Specific group 3			t		
Specific group 3				u	

* If global, group and individual addressing is required, then up to 3 MSN numbers must be allocated to the individual terminals. See subclause 5.5.

Figure A.1: Example TE configuration to analyse the requirements on MSN processing by terminals in the case of PSTN to ISDN interworking

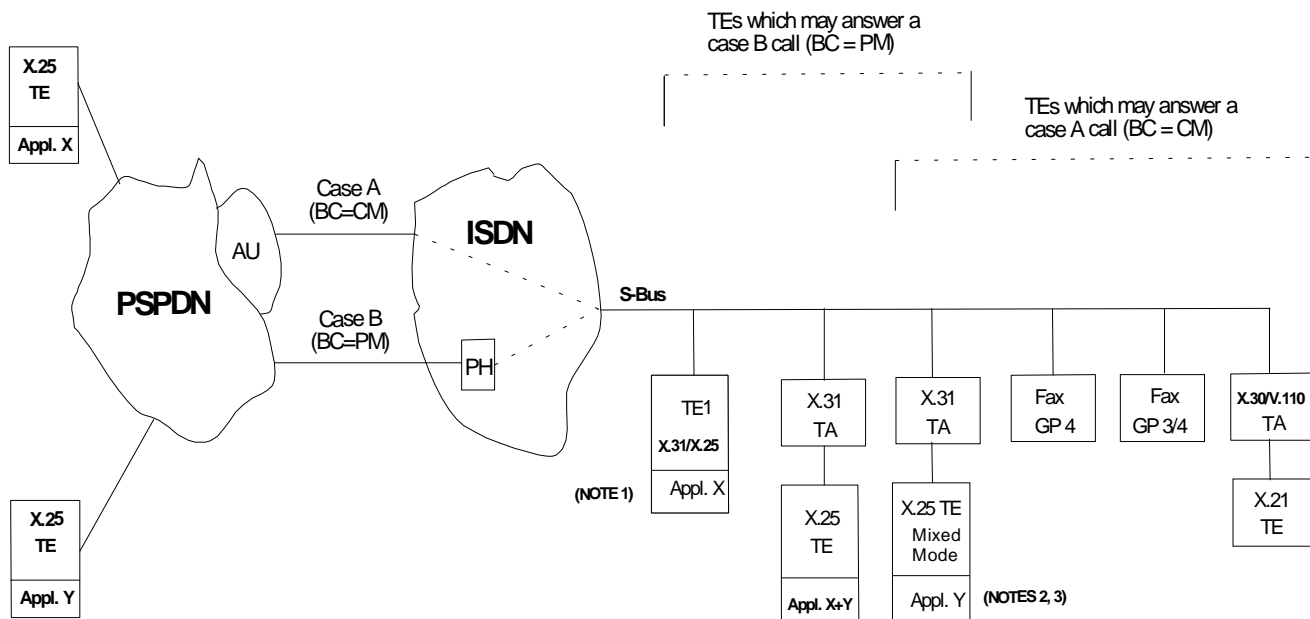
The meaning of the various MSN numbers is as follows:

- | | |
|-----------------------------------|---|
| Global MSN number = x | Addresses all terminals on the bus. |
| Specific terminal = r, s, t, etc. | Used for selection of specific terminals. |
| Group Telephony = q | Addresses all phones on the bus. |
| Data = w | May have several addresses to support several types of modem. |
| Facsimile group 3 = p | Addresses all Facsimile Group 3 terminals on the bus. |

The usage of specific MSNs may be dependent upon time of day, maintenance of certain terminals or reorganisation of the office.

Therefore the effect of such flexibility has to be taken into account in the specification and deployment of terminal address recognition abilities.

Annex B: PSPDN to ISDN connections



MSN numbering: (NOTE 4)

Global address	a	a	a	a	a	a
Group 1 (Application X)	b	b				
Specific group 1	c	d				
Group 2 (Application Y)		e	e			
Specific group 2		f	g			
Group 3 (X.25)	h	h	h			
Group 4 (Fax 4)				i	i	
Specific group 4				j	k	
Specific X.21 TE						l

Figure B.1: Example TE configuration to analyse the requirements on number processing by terminals in the case of PSPDN to ISDN interworking

NOTE 1: Possible X & Y applications:

- teletex;
- facsimile Group 4 service;
- X.400 (MHS/EDI);
- etc.

NOTE 2: A mixed mode terminal may support both circuit and packet mode X.25 communication.

NOTE 3: A full X.25 network may be implemented behind a X.31 TA. That network may also use MSN-numbering (or subaddressing).

NOTE 4: X.25 is mainly used as a bearer of different applications, such which only require outgoing access from the TE on the S-bus. The following issues must therefore be taken into consideration when TE's need of a specific number (possibly MSN) is discussed:

- what kind of applications are supported by the X.25 TE?
- will polling of the X.25 terminal be used by some host?

History

Document history	
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